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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,560	12/04/2003	Noriko Yagi	1403-0259P	5471

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EXAMINER

POULOS, SANDRA K

ART UNIT PAPER NUMBER

1714

DATE MAILED: 10/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding:

**Office Action Summary**

Application No.

10/726,560

Applicant(s)

YAGI ET AL.

Examiner

Sandra K. Poulos

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1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 6-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. All outstanding rejections and objections except for those described below are overcome by applicant's amendment filed 8/14/06.

The terminal disclaimer filed on 7/21/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Numbers 10/842,515 and 11/060,772 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Upon consideration of applicant's arguments, the rejections set forth in the action mailed 8/14/06 have been reconsidered and the following new grounds of rejection have been set forth below. Accordingly, the following action is **NON-FINAL**.

#### *Claim Objections*

2. Claim 1 is objected to because of the following informalities: the phrase "wherein protein within said natural rubber...contains an amount of at most 0.10% by weight converted to nitrogen content" is unclear. Examiner suggests "wherein within said natural rubber...the amount of protein is at most 0.10% by weight converted to nitrogen content."

#### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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3. Claims 1, 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agostini (US 2003/0092801) in view of Tanaka (US 5,622,998) and Tanaka (US 6,239,253).

Agostini discloses a pneumatic tire tread composition containing a functionalized elastomer, a coupling agent, and a reinforcing agent (abstract). The reinforcing agent is about 28 to 118 phr of carbon black, silica aggregates, or silica modified carbon black (para 9, 17-19). The silica has a BET surface area in the range of 50 to about 300 m<sup>2</sup>/g (para 80-82). Although it is measured in BET surface area, it is examiner's position that the silica would intrinsically have a NSA surface area of about the same range given that they both are measurements of surface area. The coupling agent is a bis(3-ethoxysilylpropyl)polysulfide having an average of from 2 to 2.6 or from 3.5 to 4 sulfur atoms in its polysulfide bridge (para 25-27). Although the formula (1) is not the same as the currently claimed formula, the named coupling agents meet the currently claimed formula.. Exemplary diene-based elastomers which contain functional groups include epoxidized natural rubber (epoxidized cis 1,4-polyisoprene) (para 32). The functionalized elastomer is present in an amount from 10 to 100 phr (para 12-16).

Agostini does not disclose the protein content of the rubber.

Tanaka '998 discloses a deproteinized natural rubber having that has a nitrogen content of less than 0.02% (col 5, lines 46-56; claims 2, 6). The natural rubber contains one or less epoxy groups (col 4, lines 35-38; claim 16). It is used as a reactive plasticizer for improving the processing characteristics of solid rubber such as compound rubber for tires (col 1, lines 18-20).

Tanaka '253 discloses a deproteinized natural rubber characterized in that the proteins have been eliminated to a level of a nitrogen content of less than 0.02% (col 4, lines 31-36). The deproteinized natural rubber has good electrical insulation properties, small energy losses, and is excellent in processing characteristics, mechanical properties, and appearance (col 3, lines 59-65). The rubber can be used in various fields such as an automobile tire (col 11, lines 37-42). The rubber can be blended with other components commonly employed in conventional rubber compositions (col 11, lines 43-46). Examples of such components include crosslinking agents, vulcanization accelerators, metal oxides, fatty acids, fillers and reinforcing agents (col 11, lines 47-58).

It would have been obvious to one of ordinary skill in the art to use deproteinized rubber in the composition disclosed by Agostini because of the benefits disclosed by Tanaka '998 & '253 as listed above, such as excellent processing characteristics.

Tanaka '998 & '253 discloses that the deproteinized rubber can be used in tire compositions and may be combined with other components common in the production of tires and therefore it is reasonable to expect success in deproteinizing the rubber in the compositions of Agostini. Although Tanaka '998 & '253 does not expressly disclose the tread portion of the tire, one of ordinary skill in the art would recognize the potential for all parts of the tire that make use of natural rubber components, including the tread.

4. Claims 2, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agostini (US 2003/0092801) in view of Tanaka (US 5,622,998) and Tanaka (US

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6,239,253) as applied to claims 1, 6, 7 above, and further in view of Sandstrom (US 5,489,628).

The discussion with respect to Agostini and Tanaka in paragraph 2 above is incorporated herein by reference.

Agostini does not disclose the amount of silane coupling agent.

Sandstrom discloses a tire tread for a pneumatic tire that contains 1.0 to 15 parts epoxidized natural rubber (col 1, lines 41-67). Silica with a BET surface area measured using nitrogen gas is usually 50 to 300 m<sup>2</sup>/g (col 4 line 54 to col 5 line 39).

Representative coupling agents are bis-(3-triethoxysilylpropyl)tetrasulfide and bis-(3-trimethoxysilylpropyl)tetrasulfide (col 5 line 40 to col 6 line 10). The coupling agent ranges from about 0.5 to 8, or 1 to 5 parts by weight of rubber (col 6, lines 5-10), which is analogous to the claimed amount of silica. The examples show formulations that include the epoxidized natural rubber, carbon black, silica, and organosilane coupling agent.

It would have been obvious to one of ordinary skill in the art to use the silane of Agostini in the amounts given in Sandstrom because Sandstrom demonstrates success with those amounts when used in conjunction with epoxidized natural rubber and silica for use as a tire tread.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agostini (US 2003/0092801) in view of Tanaka (US 5,622,998) and Tanaka (US 6,239,253) as applied to claims 1, 6, 7 above, and further in Hahn (US 6,646,066).

The discussion with respect to Agostini and Tanaka in paragraph 2 above is incorporated herein by reference.

Agostini does not expressly disclose bis(3-triethoxysilylpropyl)polysulfide.

Hahn discloses a rubber composition for a tire component that contains (A) a diene based elastomer (such as natural rubber) which may be functionalized with groups such as epoxy, (B) a thermoplastic material, (C) a reinforcing particulate filler selected from carbon black and silica, and (D) a coupling agent (col 1, line 53 to col 2, line 6). The coupling agents are bis(3-trialkoxysilylpropyl)polysulfide having an average of from about 2 to 2.6 or from 3.5 to 4 of connecting sulfur atoms in its polysulfidic bridge, preferably 2 to 2.6 connection sulfur atoms (col 2 line 66 to col 3 line 6); particularly bis(3-triethoxysilylpropyl)polysulfide (col 4, lines 37-41).

It would have been obvious to one of ordinary skill in the art to use bis(3-triethoxysilylpropyl)polysulfide as the coupling agent in order to increase the coupling of the silica with the elastomer (col 2, lines 1-6).

### ***Response to Arguments***

6. Applicant's arguments, particularly that the prior art references used in the previous Office action do not disclose a silane with an average sulfur chain of 2.1 to 3.5, are persuasive. Therefore, the rejections have been withdrawn and new grounds of rejection are made above. The remaining arguments are moot in view of the new ground(s) of rejection.

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### Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2003/0105212 discloses a tire component with a coupling agent having a polysulfidic bridge from 2 to 2.6, an epoxidized natural rubber, and silica.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra K. Poulos whose telephone number is (571) 272-6428. The examiner can normally be reached on M-F 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SK

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PRIMARY EXAMINER